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CHEVRON TEXACO CORPORATION
P.O. BOX 6006
SAN RAMON, CA 94583-0806

EXAMINER

GOLOBOY, JAMES C

ART UNIT PAPER NUMBER

1714

DATE MAILED: 08/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/738,388

Applicant(s)

TEQUI ET AL.

Examiner

James Goloboy

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Europe on 11/28/2003. It is noted, however, that applicant has not filed a certified copy of the EP 03292968.9 application as required by 35 U.S.C. 119(b).

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-2, 5, and 20-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Li (U.S. Pat. No. 6,288,012) in view of the evidence provided by Solozhenko (*Properties of Group III Nitrides*, J.H. Edgar ed., Section 2.1, page 43).

Li discloses a lubricant composition comprising a non-aqueous lubricant, such as an oil, as disclosed in column 3 lines 19-32, boron nitride, as disclosed in column 3 line 34, and a polymethacrylate, as disclosed in column 5 lines 27. In column 3 lines 44-45 a concentration of 0.5 to 20% by weight of boron nitride is disclosed, and in column 5

lines 31-32 a concentration of 0.5 to 15% by weight of polymethacrylate is disclosed. The ratio of boron nitride to polymethacrylate disclosed by these ranges is therefore between 40:1 and 1:30, falling well within the ranges recited in Claims 1 and 20.

Li further discloses in column 3 lines 29-30 that the lubricant composition may comprise a surfactant, as recited in Claim 5.

Li discloses the genus of boron nitride without any indication of the desired morphological species. Solozhenko provides evidence that there are four species of boron nitride—hexagonal, rhombohedral, cubic, and wurtzitic. Given the limited number of species encompassed by boron nitride, the use of the hexagonal species is anticipated. Case law holds that a genus may anticipate a claimed species of the number of possible species within the specific genus is sufficiently limited. See *In re Schaumann*, 572 F.2d 312, 197 USPQ 5 (CCPA 1978).

4. Claims 1-2, 6, 9, 20-21, and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Pacholke in view of the evidence provided by Solozhenko (*Properties of Group III Nitrides*, J.H. Edgar ed., Section 2.1, page 43).

Pacholke discloses in column 3 lines 20-53 an additive composition comprising boron nitride (line 24), an ethylene-propylene olefin copolymer (line 28), which may be combined in a 4:1 ratio, and a carrier fluid (column 6 lines 10-21), which may be an oil, forming the additive composition recited in Claims 1 and 2, and 9. Ethylene-propylene copolymers are also usable as dispersants.

Pacholke also discloses in column 3 lines 54-55 that the additive is added to a lubricating oil, specifically a gear oil, forming the lubricant composition recited in Claims 20-21 and 23.

In column 5 line 37, Pacholke further discloses an additive composition comprising 25% of the olefin copolymer by weight. As the disclosure does not reveal the possibility of any additional components in the additive, it is clear that the carrier fluid (oil) and solid lubricant (boron nitride) must make up the other 75%, falling within the range recited in Claim 6.

Pacholke discloses the genus of boron nitride without any indication of the desired morphological species. Solozhenko provides evidence that there are four species of boron nitride—hexagonal, rhombohedral, cubic, and wurtzitic. Given the limited number of species encompassed by boron nitride, the use of the hexagonal species is anticipated. Case law holds that a genus may anticipate a claimed species of the number of possible species within the specific genus is sufficiently limited. See *In re Schaumann*, 572 F.2d 312, 197 USPQ 5 (CCPA 1978).

Claim Rejections - 35 USC § 103

Some dependent claims have been rejected under 103(a) over both Li in view of... and Pacholke in view of... because Li discloses the polymethacrylate of Claim 1, while Pacholke discloses the olefin copolymer.

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

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the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Li in view of Dickey (*Kirk-Othmer Encyclopedia of Chemical Technology*, Vol. 15., *Lubrication and Lubricants*, p. 33)

The discussion of Li in paragraph 3 above is incorporated here by reference. Li does not specifically disclose hexagonal boron nitride.

Dickey discloses on page 33 that hexagonal boron nitride provides "excellent lubrication". No other types of boron nitride are mentioned in the article.

It would have been obvious to one of ordinary skill in the art to use the hexagonal form of the boron nitride disclosed by Li, in order to gain extra lubricity, based on the teaching of Dickey.

8. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pacholke in view of Dickey (*Kirk-Othmer Encyclopedia of Chemical Technology*, Vol. 15., *Lubrication and Lubricants*, p. 33)

The discussion of Pacholke in paragraph 4 above is incorporated here by reference. Pacholke does not specifically disclose hexagonal boron nitride.

Dickey discloses on page 33 that hexagonal boron nitride provides "excellent lubrication". No other types of boron nitride are mentioned in the article.

It would have been obvious to one of ordinary skill in the art to use the hexagonal form of the boron nitride disclosed by Pacholke, in order to gain extra lubricity, based on the teaching of Dickey.

9. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Li in view of De Vries (U.S. Pat. No. 4,094,799).

The discussion of Li in paragraph 3 above is incorporated here by reference. Li does not disclose a particle size distribution for boron nitride.

De Vries, in column 2 lines 14-28, discloses a solid lubricant additive which may be boron nitride (line 26), and preferably has a maximum particle size of as low as 0.001 microns (1 millimicron, lines 19-21).

It would have been obvious to one of ordinary skill in the art to include in the additive composition taught by Li a boron nitride with the small particle size taught by De Vries, in order to impart superior lubricity to the composition, as disclosed in column 2 lines 14-16 of De Vries.

10. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pacholke in view of De Vries (U.S. Pat. No. 4,094,799).

The discussion of Pacholke in paragraph 4 above is incorporated here by reference. Pacholke does not disclose a particle size distribution for boron nitride.

De Vries, in column 2 lines 14-28, discloses a solid lubricant additive which may be boron nitride (line 26), and preferably has a maximum particle size of as low as 0.001 microns (1 millimicron, lines 19-21).

It would have been obvious to one of ordinary skill in the art to include in the additive composition taught by Pacholke a boron nitride with the small particle size taught by De Vries, in order to impart superior lubricity to the composition, as disclosed in column 2 lines 14-16 of De Vries.

11. Claims 4 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pacholke.

The discussion of Pacholke in paragraph 4 above is incorporated here by reference. Pacholke does not specifically disclose a concentration of between 1 and 50% by weight of boron nitride in oil, or a concentration of between 1 and 20% of the additive composition in the lubricant composition.

In column 4 line 63, Pacholke discloses a concentration of between 0.01 and 65% for boron nitride within the full additive composition. In column 5 line 39, Pacholke discloses a concentration of between 3.0 and 5.0% by weight for the olefin copolymer component. As the only other component in the additive mixture is the oil dispersion of boron nitride, this dispersion therefore makes up between 95 to 97% by weight of the additive composition, meaning that the concentration of boron nitride in the oil

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dispersion is between about 0.01 and about 68% ($65/95 = 0.68$), encompassing the range recited in Claim 4. In column 4 lines 63-65, Pacholke notes that the final selection a boron nitride concentration from within the disclosed range depends on the application, signifying the concentration as a result-effective variable. Generally, differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. See MPEP § 2144.05 (B). Case law holds that “discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art.” See *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Pacholke also shows, in columns 6-7 (Examples 1-3), three sample additive compositions comprising equal amounts of a solid lubricant and a neutral petroleum oil—equivalent to a 50% dispersion of the solid lubricant in oil, matching the 50% endpoint of the range recited in Claim 4. Although the sample compositions utilize molybdenum disulfide and graphite as the solid lubricant, the list in column 3 lines 22-27 names boron nitride as an alternative solid lubricant, and the sample compositions strongly suggest to one of ordinary skill in the art the 50% dispersion recited in Claim 4.

In column 5 line 46, Pacholke discloses a range of between 0.001 to 10% by weight of the additive composition in the overall lubricant composition, substantially overlapping the range recited in Claim 22.

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12. Claims 1, 7, 8, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li in view of Ishikawa (U.S. Pat. No. 5,780,399).

The discussion of Li in paragraph 3 above is incorporated here by reference. The differences between Li and the present claims are:

i) Li does not specifically disclose a dispersant polymethacrylate. This relates to Claims 1 and 20.

ii) Li does not disclose a hydrocarbon side chain on a polymethacrylate. This relates to Claims 7 and 8.

With respect to i), Ishikawa, in column 8 lines 25-33, discloses both non-dispersant and dispersant polymethacrylates as an additive for enhancing the viscosity index of a lubricant composition, as recited in Claims 1 and 20.

With respect to ii), Ishikawa discloses in column 9 lines 8-14 discloses that the dispersant polymethacrylate has a hydrocarbon chain with 1 to 18 carbons. Although the terms "short", "medium", and "long" recited in Claims 7 and 8 are not defined within the claim, the range given in the reference for the length of the hydrocarbon chains encompasses all the types disclosed on page 8 lines 18-28 of the present specification. The detailed description is a dictionary for the claims. See MPEP § 608.01(g).

It would have been obvious to one of ordinary skill in the art to incorporate into the lubricant composition of Li a dispersant polymethacrylate with a short, medium, or long hydrocarbon chain for the purpose of obtaining enhanced dispersancy and viscosity-temperature behavior with a single additive.

13. Claims 10-13 and 15-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li in view of Peeler (U.S. Pat. No. 3,313,797).

The discussion of Li in paragraph 3 above is incorporated here by reference. Li does not disclose a hydrated alkali metal borate.

Peeler, in the reference's Claim 1 discloses an oil dispersion of an alkali metal borate and a dispersant (the borate is "dispersed by means of a lyophilic surface active agent"), as recited in Claims 10 and 14. In the reference's Claims 5 and 6, Peeler teaches that the alkali metal may be sodium or potassium, as in Claims 11 and 12. In the reference's Claim 1 is it also taught that the borate is present in the oil dispersion in a concentration of 2 to 60% by weight, substantially overlapping the broad ranges recited in Claim 15 and 19, and encompassing the range recited in Claim 16 while matching the endpoint at 2%.

Peeler further discloses in column 3 lines 35-36 that a detergent may be added to the dispersion as recited in Claim 17, and in column 3 lines 38-39 teaches that the detergent may be present in a concentration of 0.1 to 5%, overlapping the range recited in Claim 18.

It would have been obvious to one of ordinary skill in the art to include in the lubricant composition of Li the oil dispersions of hydrated alkali metal borates disclosed by Peeler in order to obtain better extreme pressure lubricating performance, as taught in column 1 lines 53-56 of Peeler. It would have been obvious to include a detergent in the oil dispersion of hydrated alkali metal borates for the purpose of preventing the buildup of residues.

14. Claims 10-13 and 15-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pacholke in view of Peeler.

The discussion of Pacholke in paragraph 4 above is incorporated here by reference. Pacholke does not disclose a hydrated alkali metal borate.

Peeler, in the reference's Claims 1 discloses an oil dispersion of an alkali metal borate and a dispersant (the borate is "dispersed by means of a lyophilic surface active agent"), as recited in Claims 10 and 14. In the reference's Claims 5 and 6, Peeler teaches that the alkali metal may be sodium or potassium, as in Claims 11 and 12. In the reference's Claim 1 is it also taught that the borate is present in the oil dispersion in a concentration of 2 to 60% by weight, substantially overlapping the broad ranges recited in Claim 15 and 19, and encompassing the range recited in Claim 16 while matching the endpoint at 2%.

Peeler further discloses in column 3 lines 35-36 that a detergent may be added to the dispersion as recited in Claim 17, and in column 3 lines 38-39 teaches that the detergent may be present in a concentration of 0.1 to 5%, overlapping the range recited in Claim 18.

It would have been obvious to one of ordinary skill in the art to include in the lubricant composition of Pacholke the oil dispersions of hydrated alkali metal borates disclosed by Peeler in order to obtain better extreme pressure lubricating performance, as taught in column 1 lines 53-56 of Peeler. It would have been obvious to include a

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detergent in the oil dispersion of hydrated alkali metal borates for the purpose of preventing the buildup of residues.

15. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Li in view of Peeler as applied to claims 10-13 and 15-19 above, and further in view of Brown (U.S. Pat. No. 5,641,730).

The discussion of Li in view of Peeler in paragraph 13 above is incorporated here by reference. Li in view of Peeler does not disclose hydrated potassium triborate as an alkali metal borate additive.

Brown, in column 2 lines 26-27 discloses the use of hydrated potassium triborate as a preferred alkali metal borate.

It would have been obvious to one of ordinary skill in the art to modify Li in view of Peeler to include the use of hydrated potassium triborate due to its favorable extreme pressure properties, as taught in column 2 line 30-32 of Brown.

16. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pacholke in view of Peeler as applied to claims 10-13 and 15-19 above, and further in view of Brown (U.S. Pat. No. 5,641,730).

The discussion of Pacholke in view of Peeler in paragraph 14 above is incorporated here by reference. Pacholke in view of Peeler does not disclose hydrated potassium triborate as an alkali metal borate additive.

Brown, in column 2 lines 26-27 discloses the use of hydrated potassium triborate as a preferred alkali metal borate.

It would have been obvious to one of ordinary skill in the art to modify Pacholke in view of Peeler to include the use of hydrated potassium triborate due to its favorable extreme pressure properties, as taught in column 2 line 30-32 of Brown.

Double Patenting

17. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

18. Claims 1-23 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-17 of copending Application No. 10/624,240 in view of Papay (U.S. Pat. No. 5,652,201).

The claims of the '240 application recite an additive composition comprising an oil dispersion of a hexagonal boron nitride and an oil dispersion of a hydrated alkali metal borate in a ratio of between 95:5 and 5:95. The claims of the '240 application further recite a lubricant composition comprising the additive composition described above.

The difference between the claims of the '240 application and Claims 1-23 of the present application is that the '240 application does not include a viscosity index improver.

Papay, in column 46 lines 27-43, discloses viscosity index improvers as a standard additive in lubricant compositions, and specifically discloses an ethylene-propylene copolymer (lines 34). In column 56 line 67 (Example XII), Papay discloses a

composition comprising 7.200% viscosity index improver by weight, meaning that the maximum possible ratio of boron nitride to viscosity index improver for the composition would be about 12.9:1, well within the range disclosed in the present claims.

It would be obvious to include a viscosity index improver to the additive and lubricant compositions claimed in the '240 application in order to obtain a desired dependence of viscosity on temperature for the lubricant composition.

This is a provisional obviousness-type double patenting rejection, as the conflicting claims of the '240 application have not been patented.

Conclusion

19. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kristen (U.S. Pat. No. 4,713,186) discloses a lubricant additive containing boron nitride and a polymethacrylate viscosity index improver.

Kitahara (U.S. Pat. No. 5,723,417) shows a dispersant and a non-dispersant polymethacrylate.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James Goloboy whose telephone number is 571-272-2476. The examiner can normally be reached on M-F 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone

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number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JCG
JCG

Vasu Jagannathan
VASU JAGANNATHAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700